

Electronic Supplementary Information for RSC Advances

Electrochemical detection of adenine and guanine using a self-assembled copper(II)-thiophenyl-azo-imidazole complex monolayer modified gold electrode

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Supplementary

The diazotization-coupling reaction was confirmed further by electrochemical measurement. The results are shown in Figure 1. After the derivatization, characteristic cyclic voltammetry peaks of azo groups can be found clearly. Cyclic voltammogram of the IATP modified gold electrode in different scan rate supports the electrochemical stability of the modified electrode.

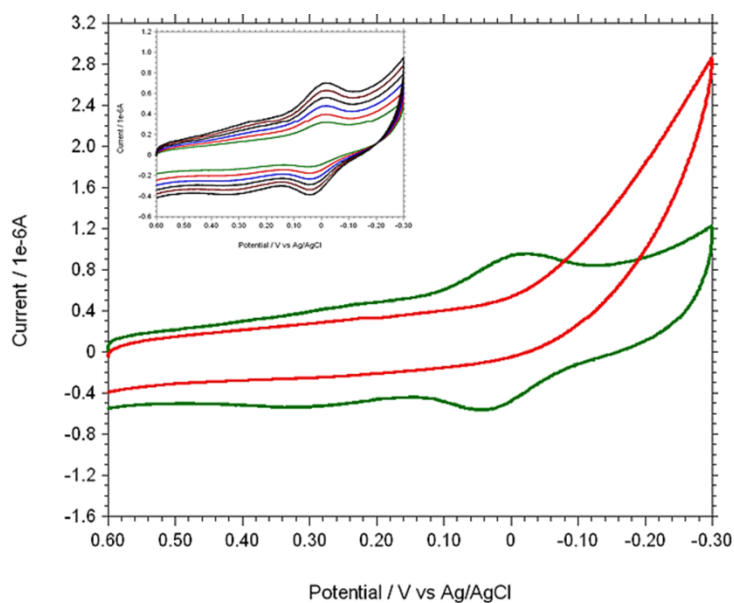
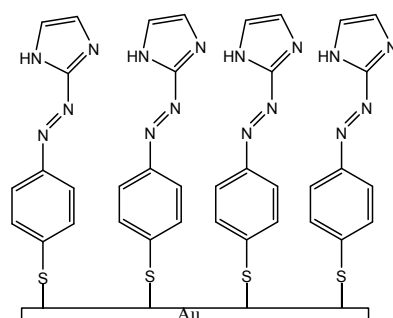


Figure 1 Cyclic voltammogram of ATP (red curve) and IATP (green curve) SAM modified gold electrode in 0.1 M PBS (pH = 7).[Inset: CV at different scan rate 0.1 to 0.55 V/s]

Supplementary Figures

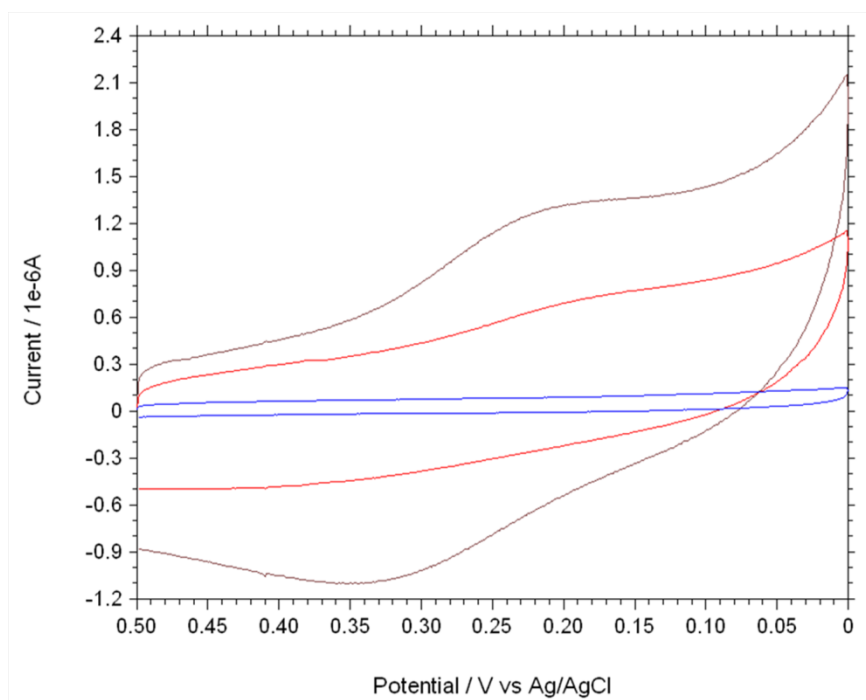


Fig S1 Overlaid cyclic voltammograms of bare Au (red line), ATP-Au (blue line), Cu²⁺-IATP-Au (violet line) modified electrode in 0.1 M PBS at pH 7.

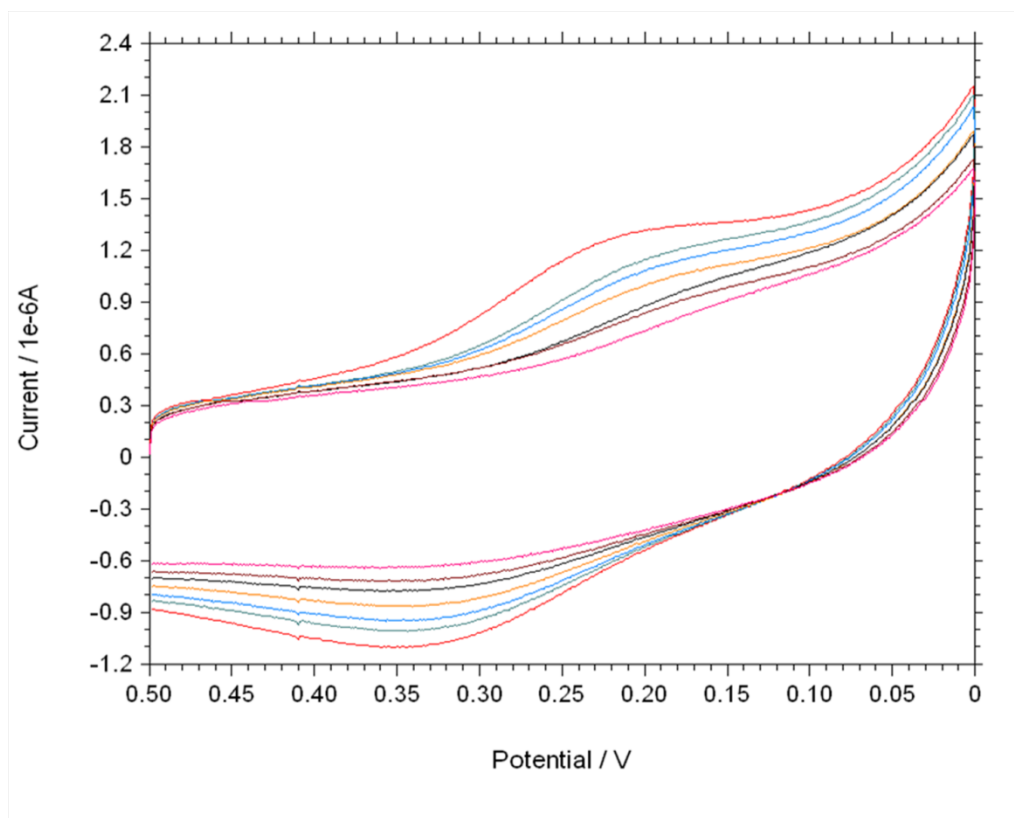


Figure S2 Cyclic voltammogram of IATP-Au electrode in varying concentration of CuSO_4 [0.1 mM -0.7 mM] in 0.1 M PBS at pH 7.0.

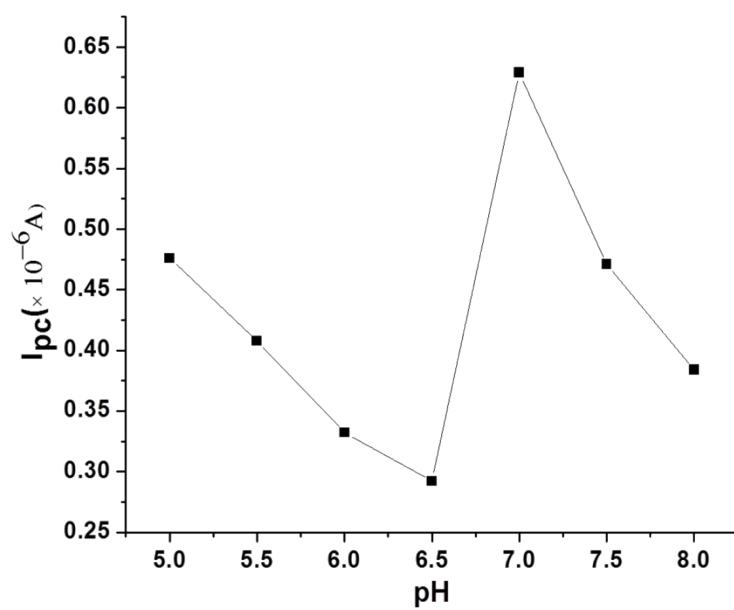


Figure S3. Plot of pH versus cathodic peak current (I_{pc}) for copper complexation with IATP-Au electrode in 0.1 M PBS solution

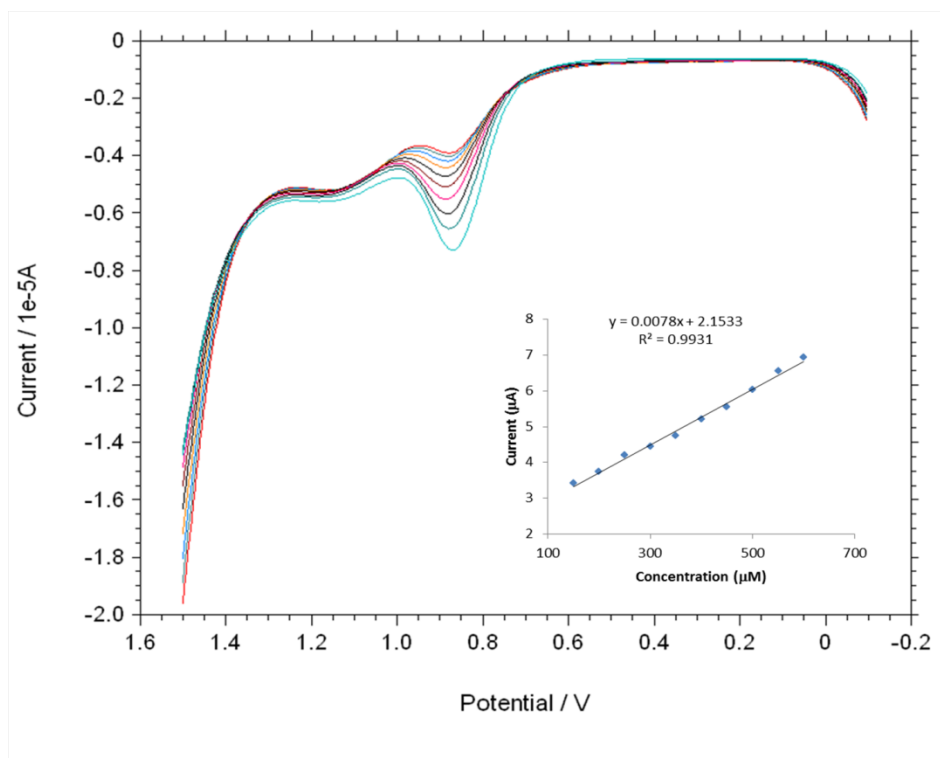


Figure S4 Overlaid DPV with increasing guanine concentration (150 - 600 μM) in 0.1 M PBS (pH 7). [Inset: Plot of current as a function of concentration of guanine with linear trend line ($R^2 > 0.99$)].

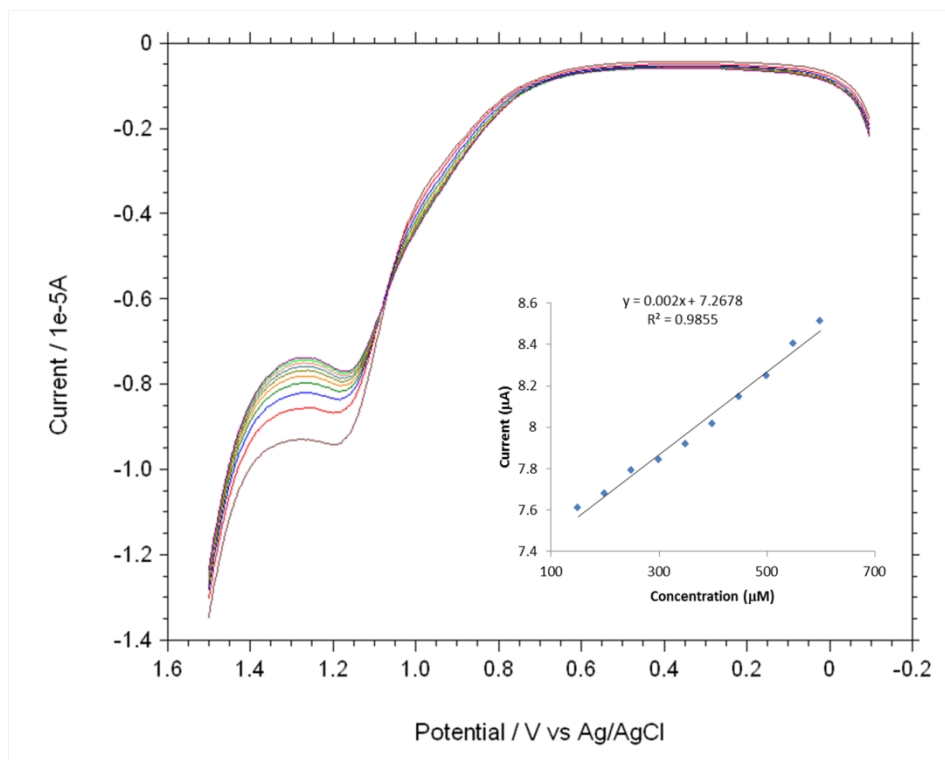
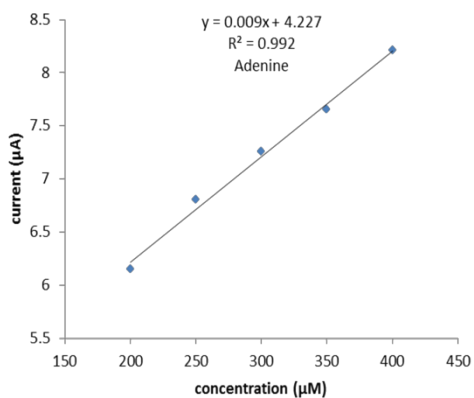
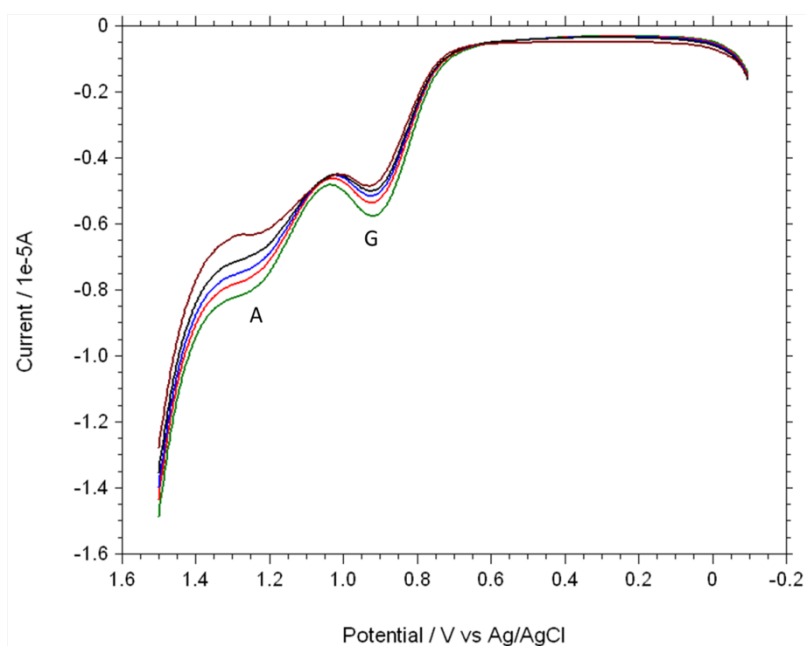
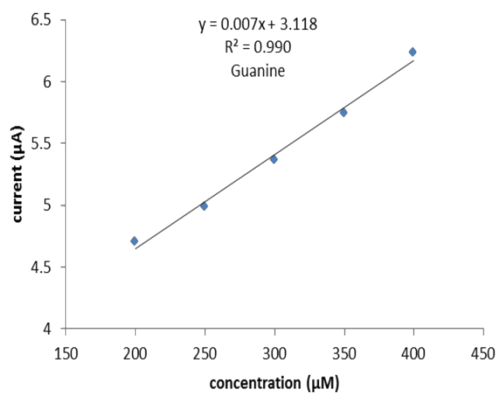


Figure S5 Overlaid DPV with increasing Adenine concentration (150 - 600 μM) in 0.1 M PBS (pH 7). [Inset: Plot of current as a function of concentration of adenine with linear trend line ($R^2 = 0.985$)].

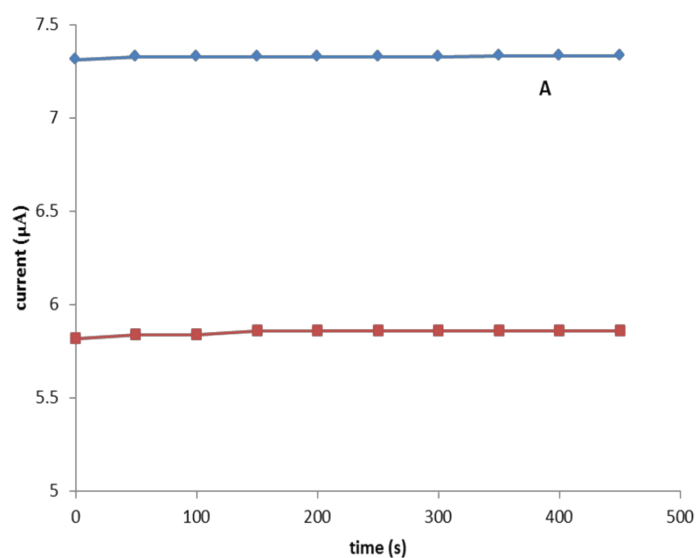


(A)

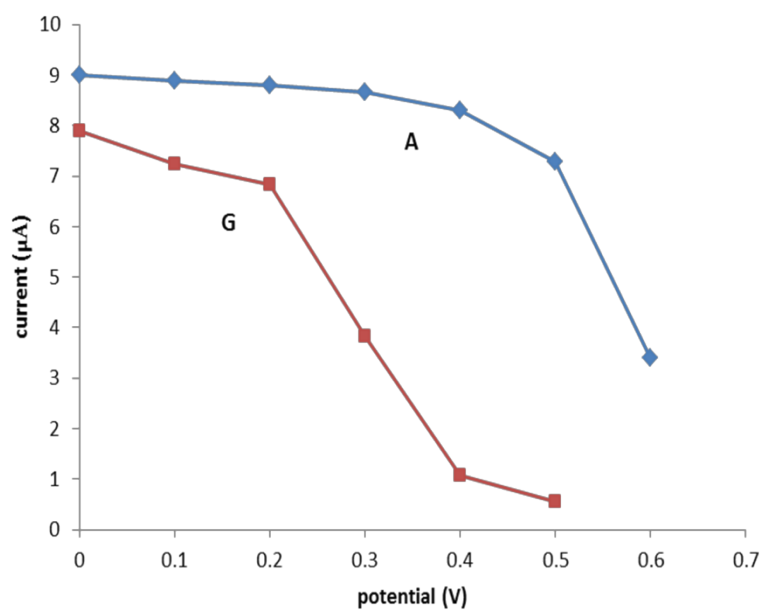


(B)

Figure S6 DPV obtained for A and G with each increment of 50 μM each A and G at Cu²⁺-IATP-Au SAM electrode in 0.1 M PBS (pH = 7). [(A) Plot of current as a function of concentration of adenine with linear trend line ($R^2 = 0.992$), (B) Plot of current as a function of concentration of guanine with linear trend line ($R^2 = 0.99$)].

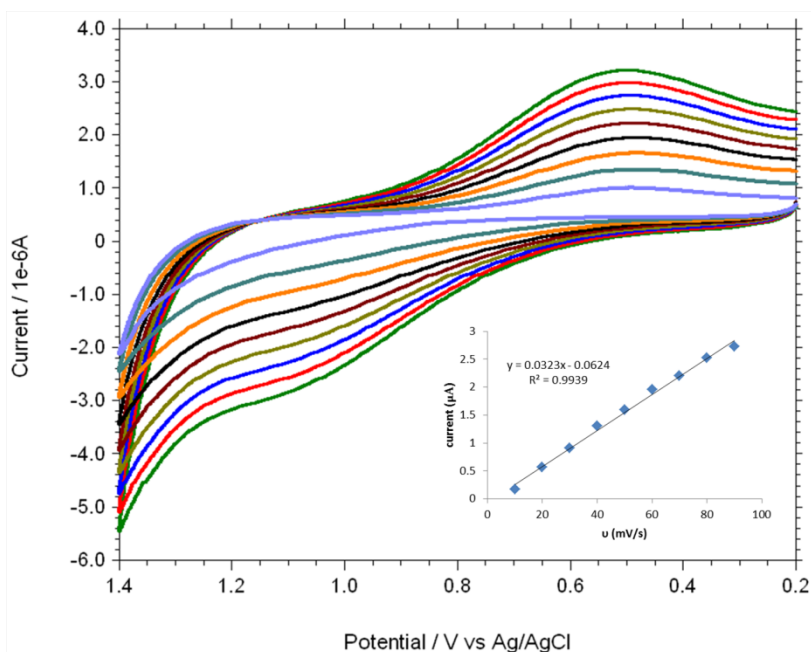


(a)

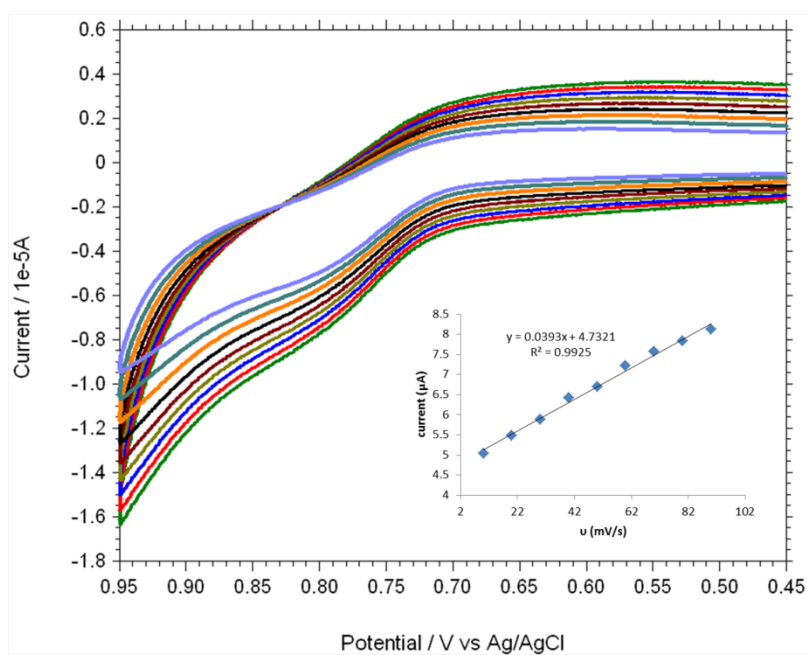


(b)

Fig. S7 (a) A plot of accumulation time *versus* oxidation peak current for adenine (blue line) and guanine (red line); (b) A plot of accumulation potential *versus* oxidation peak current for adenine (blue line) and guanine (red line)



(a)



(b)

Fig. S8 Overlaid Cyclic voltammogram of adenine (a) and guanine (b) with different scan rate (10-90 mV/s) at Cu^{2+} -IATP-Au electrode [Inset (a) Plot of current as a function of scan rate of adenine with linear trend line ($R^2 = 0.9939$) and (b) Plot of current as a function of scan rate of guanine with linear trend line ($R^2 = 0.9925$)

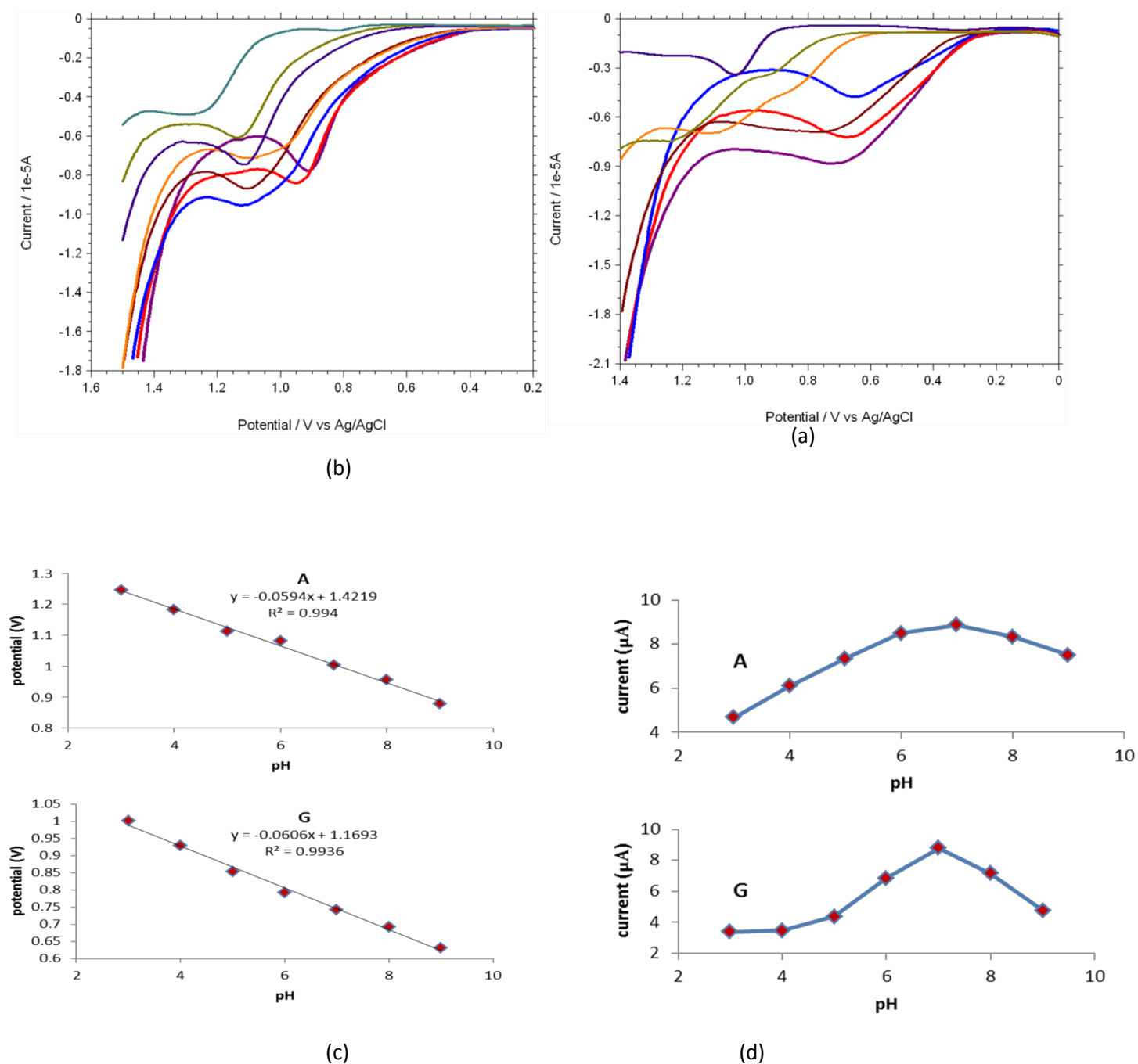


Fig. S9 DPV obtained for 1.0 mM adenine (a) and 1.0 mM guanine (b) at Cu²⁺-IATP-Au electrode in different pH (3.0 – 9.0). (c) The Plot of the oxidation peak potential *versus* the solution pH for A and G. (d) The Plot of the oxidation peak current *versus* the solution pH for A and G.

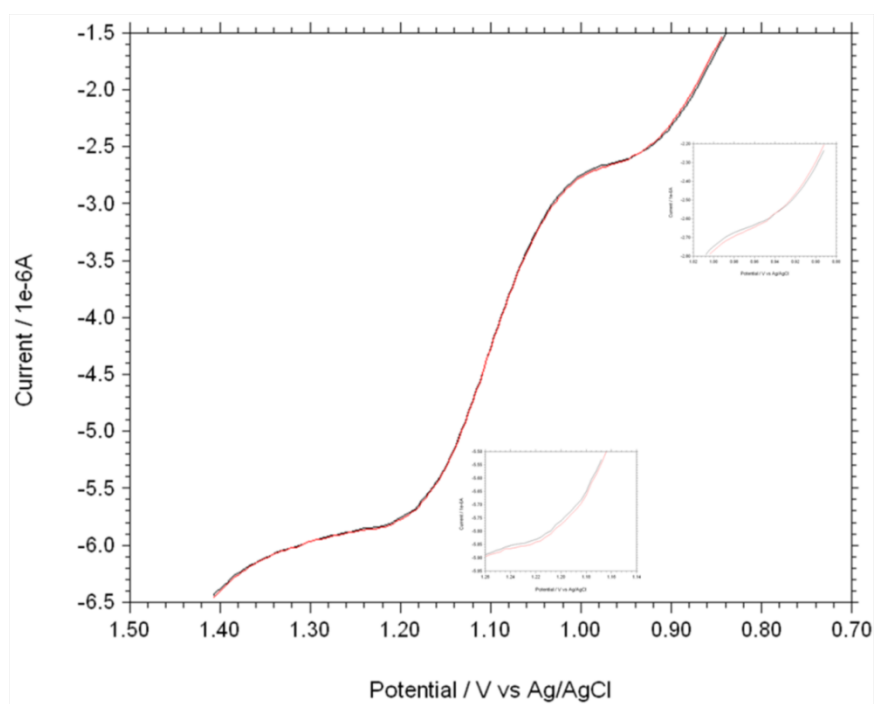


Fig. S10 DPV of A and G in presence of 1000 fold excess of Ascorbic acid